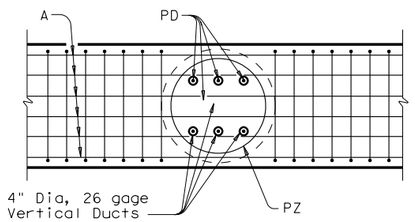
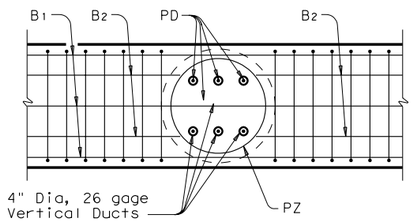
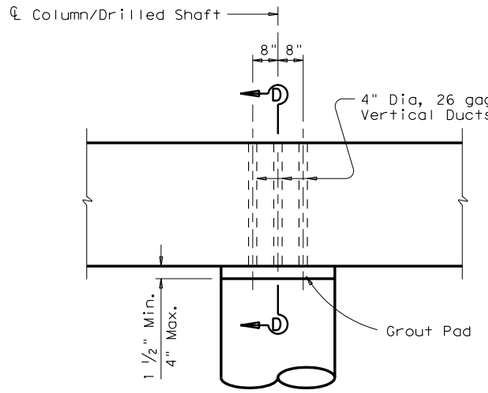


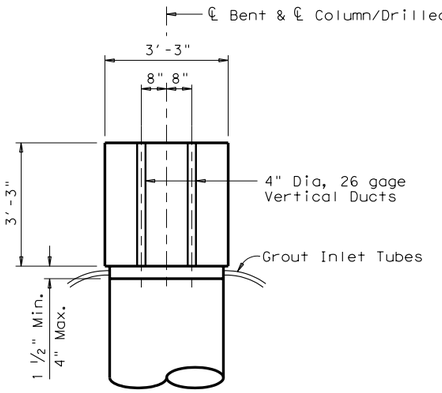
VIEW A-A



SECTION B-B



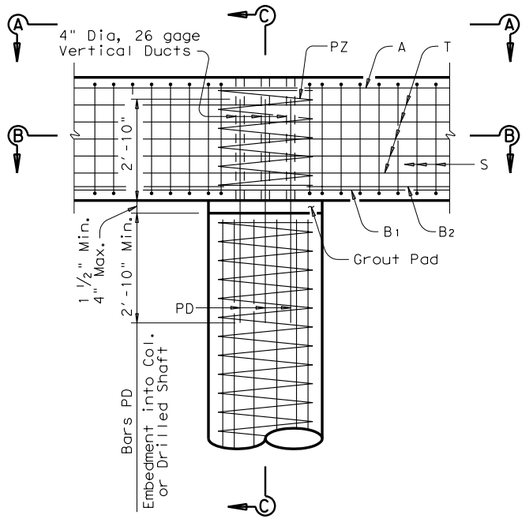
ELEVATION

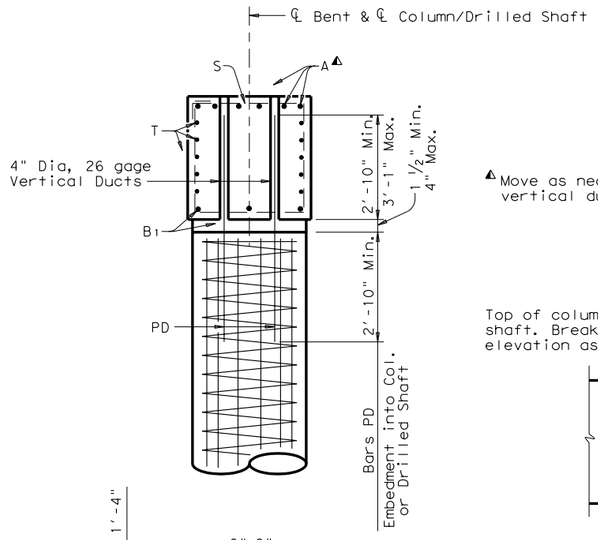


SECTION D-D

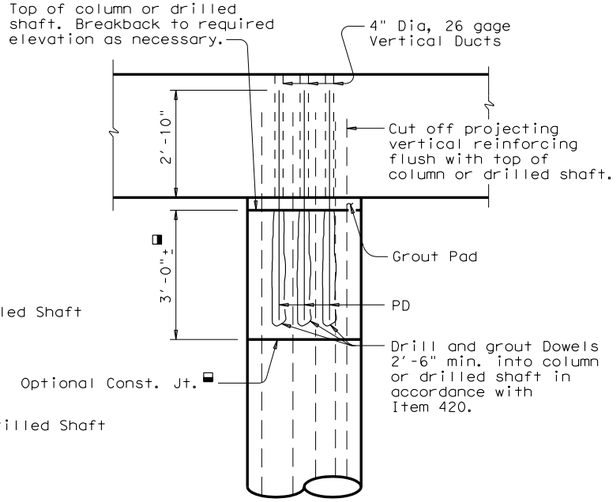
DETAILS SHOWING DUCT PLACEMENT

SHOWING CENTER COLUMN, OUTSIDE COLUMNS SIMILAR



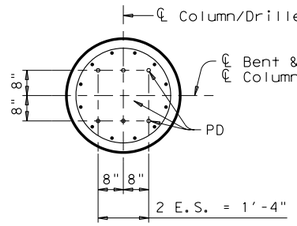


△ Move as necessary to clear vertical ducts.

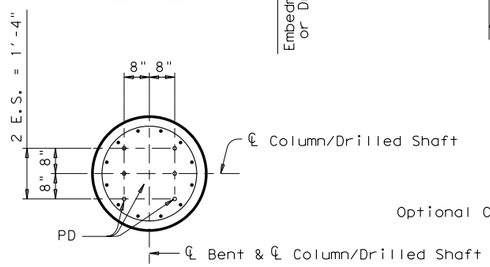


NOTE:
Beam Dowels may be precast into the cap or drilled and grouted into the cap in accordance with Item 420.

Bearing seats may be precast or cast in place using the pedestal details on Sheet 3 of 3.



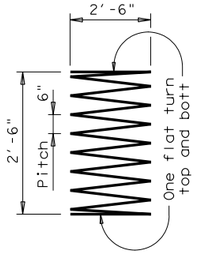
PART ELEVATION



SECTION C-C

DETAILS SHOWING DUCT REINFORCING

SHOWING CENTER COLUMN, OUTSIDE COLUMNS SIMILAR



BARS PZ (#3)

DETAILS FOR CONNECTING TO EXISTING COLUMN OR DRILLED SHAFT

SHOWING CENTER COLUMN, OUTSIDE COLUMNS SIMILAR

■ The Contractor with approval of the Engineer may alternately breakback column or drilled shaft and form/cast the top 3'-0", provided that all the existing steel can be extended into this construction. Projecting vertical steel shall be cut off 2" below top of column or drilled shaft.

GENERAL NOTES

Designed according to AASHTO 1996 Standard and current Interim Specifications, and TxDOT Research Project 1748.
All reinforcing shall be Grade 60.
Class "C" Concrete strength f'c = 3600 psi.
See Interior Bent sheets for additional details.

CHANGE ORDER NO._____

HS20 LOADING SHEET 1 OF 3

STATE OF TEXAS
LLOYD M. WOLF
73649
REGISTERED PROFESSIONAL ENGINEER

Texas Department of Transportation
Design Division (Bridge)

PRECAST CONCRETE BENT CAP DETAILS

SH 66 / LAKE RAY HUBBARD

FILE: 5691ib01.dgn	DN: MH/LW	CK: LMW	DW: RNP	CK: MDH
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REVISIONS	18	NH 99(367)		249A
8/00 - Precast Bent Cap option details. MDH/RNP	COUNTY	CONTROL	SECT	JOB	HIGHWAY
	ROCKWALL	0009	04	039	SH 66

7/01 - New details for EB Bridge MDH/RNP

LEVELS DISPLAYED
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32
33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48
49 50 51 52 53 54 55 56 57 58 59 60 61 62 63

PATH: \RPORTER-WS3
5691ib01.dgn

PRECAST BENT CAP CONSTRUCTION NOTES

Construction shall be in accordance with the requirements of Item 420. Vertical Ducts shall be semi-rigid spirally crimped, corrugated duct of galvanized, cold rolled steel conforming to ASTM A527 and ASTM A619. Corrugations shall have an amplitude of 0.094 in.

Precast Bent Caps shall be handled, moved, stored and placed in the structure in a manner to avoid chipping, cracking, fractures and excessive bending stresses or damage. Precast Caps shall not be stacked more than 3 high. They shall be supported on firm blocking until placed and shimmed into final position. Blocking shall be installed such that uneven settlement due to wet ground or inadequate material underneath the blocking will not occur.

The Contractor may alter mix design and/or move or place caps before completing the prescribed curing period in Item 420 provided all of the following conditions are met:

1. The concrete has reached a flexural strength of 355 psi or a compressive strength of 2500 psi.
2. The curing time is interrupted for no more than 2 hours.
3. The alternate plan meets the approval of the Engineer.

Place column/drilled shafts in accordance with Item 420. If the connection dowels (Bars PD) are inserted after the concrete has been placed, the concrete shall be re-vibrated. Dowel placement tolerance is + ½" (plan and elevation).

Caps may be placed on columns/drilled shafts after the column/drilled shaft concrete has achieved a flexural strength of 355 psi (or 2500 psi compressive strength). Use plastic shims or friction collars to support the caps at the proper elevation prior to grouting. Total area of plastic shims used on top of each column may not exceed 6% of the column area. Column/Drilled Shaft curing may be interrupted a maximum of two hours to allow placement of plastic shims or friction collars and placement of the cap.

Grout forms and tubes (input type and location) shall be approved prior to grouting. Connection shall be grout tight such that fluid grout does not leak out before grout has achieved initial set.

All grout for precast connections shall consist of prepackaged, cementitious, non-shrink grout in accordance with ASTM C-1107 and the additional performance requirements listed in the Table of Grout Performance Specifications, including mechanical properties, compatibility, constructability and durability. Table requirements shall govern over ASTM C-1107 requirements. Grout using metallic formulations will not be allowed. Grout shall be free of chlorides. No additives shall be added to prepackaged grout. Fluid grout shall not exhibit frothing or foaming.

Prior to construction, the Contractor shall demonstrate the adequacy of the grout and the grouting system to the satisfaction of the Engineer.

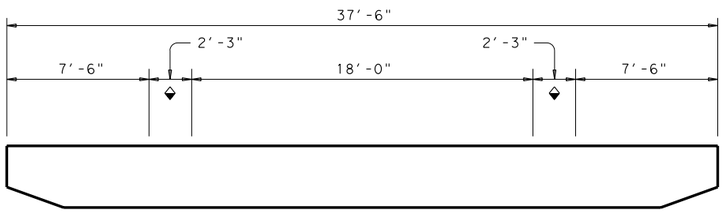
Three (3) 2" x 2" x 2" grout cube samples will be cast for each precast bent cap (one per precast cap-to-column connection) by the Contractor and given to TxDOT for testing to ensure that the grout meets the specified mechanical property criteria for compressive strength. Failure to meet strength criteria or evidence of frothing or foaming shall be cause for removal and recasting of the connection as deemed necessary by the Engineer. Grout selected shall meet the other criteria listed as well.

Prestressed beams may be placed on the caps after a grout compressive strength of 2500 psi has been achieved.

If the Contractor wishes to deviate from these requirements, a work plan and supporting calculations shall be submitted to the Engineer for review and approval. The plan and calculations shall be sealed by an Engineer registered in the State of Texas.

TABLE OF GROUT PERFORMANCE SPECIFICATIONS

PROPERTY	VALUES	
MECHANICAL	AGE	COMPRESSIVE STRENGTH (psi)
Compressive strength (ASTM C-109, 2" cubes)	1 day	2500
	3 days	4000
	7 days	5000
	28 days	5800
COMPATIBILITY		
Expansion Requirements (ASTM C-827 & ASTM C-1090)	Grade B or C ~ expansion per ASTM C-1107	
Modulus of elasticity (ASTM C-469)	$2.8 - 5.0 \times 10^6$ psi	
Coefficient of thermal expansion (ASTM C-531)	$3.0 - 10.0 \times 10^6$/deg F	
CONSTRUCTABLITY		
Flowability (ASTM C-939; CRD-C 611 Flow Cone)	fluid consistency eflux time: 20-30 seconds	
Set Time (ASTM C-191)		
Initial	2.5-5.0 hrs	
Final	4.0-8.0 hrs	
DURABILITY		
Freeze Thaw (ASTM C-666)	300 cycles, RDF 90%	



◆ Allowable Lift Point Regions. Design lift point load is 33 tons, including impact factor of 2. If bearing seats are precast, lifting anchors are not allowed at the locations of bearing seats. The Contractor may submit other lifting points/schemes to the Engineer for review and approval. After bent caps are in place, lifting device pockets at expansion joint bents shall be patched with a cement grout.

LIFTING DIAGRAM

EASTBOUND LANES

PRECAST BENT CAP QUANTITY ADJUSTMENTS

Shorten column Bars V by 2'-6" and reduce reinforcing steel total by:
Bents 3 - 5 ~ 387 Lbs.
Bents 6 - 31 ~ 255 Lbs.

Shorten drilled shaft vertical reinforcing by 2'-6" at Bents 2 & 32-44

Lengthen Bars B_2 to 11'-11" (11" additional) ~ 20 Lbs. total

Add 18 Bars PD (#11 X 6'-0") ~ 574 Lbs. total

Add 3 Bars PZ (#3 X 55'-1") ~ 62 Lbs. total

Reduce Class "C" Concrete by 0.2 C.Y.

Ducts, non shrink grout and grout tubes shall be subsidiary to Class "C" Concrete.

For Contractors information, grout quantity is 0.30 C.Y. per bent.
(Based on a 2" grout pad thickness.)

STATE OF TEXAS
LLOYD M. WOLF
73649
REGISTERED PROFESSIONAL ENGINEER

CHANGE ORDER NO._____

HS20 LOADING SHEET 2 OF 3

Texas Department of Transportation
Design Division (Bridge)

PRECAST CONCRETE BENT CAP DETAILS

SH 66 / LAKE RAY HUBBARD

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REVISIONS	18	NH 99(367)		249B
8/00 ~ Precast Bent Cap option details. MDH/RNP	COUNTY	CONTROL	SECT	JOB	HIGHWAY
7/01 ~ New details for EB Bridge MDH/RNP	ROCKWALL	0009	04	039	SH 66

LEVELS DISPLAYED
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32
33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48
49 50 51 52 53 54 55 56 57 58 59 60 61 62 63

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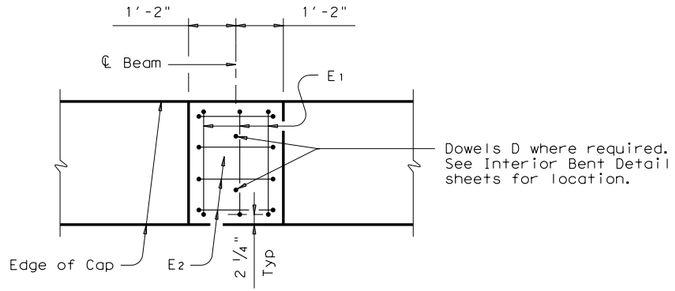
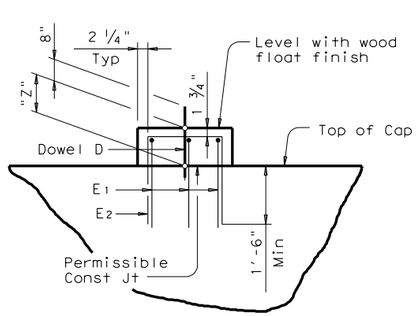


PLAN



ELEVATION

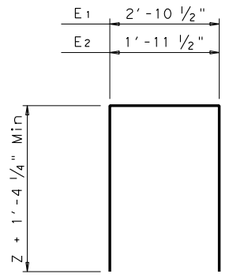
The controlling elevation for a given beam at a given bent shall be the lower of the BK and FWD elevations.

"Z"	E1			E2			Class "C" Conc
in	No	Length	Weight	No	Length	Weight	CY
3	3	6'-1"	19	4	7'-10"	33	0.1
6	3	6'-7"	21	4	8'-1"	34	0.2
9	3	7'-1"	22	4	8'-4"	35	0.2
12	3	7'-7"	24	4	8'-7"	36	0.3

For Contractor's information (per pedestal)

PEDESTAL DETAILS

Where bearing seat buildup height, Z, is 3" or greater, a reinforced pedestal shall be provided. For heights less than 3", the bearing seat detail given on the Interior Bent sheets may be used.



BARS E (#5)

Bend as necessary to avoid ducts in precast cap option.

LEVELS DISPLAYED
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17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32
33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48
49 50 51 52 53 54 55 56 57 58 59 60 61 62 63

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CHANGE ORDER NO._____

HS20 LOADING SHEET 3 OF 3

Texas Department of Transportation
Design Division (Bridge)

PRECAST CONCRETE BENT CAP DETAILS

SH 66 / LAKE RAY HUBBARD

STATE OF TEXAS
LLOYD M. WOLF
73649
REGISTERED PROFESSIONAL ENGINEER

7/01 ~ New details for EB Bridge MDH/RNP

8/00 ~ Precast Bent Cap option details. MDH/RNP

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	COUNTY		CONTROL	SECT	JOB	HIGHWAY
	ROCKWALL		0009	04	039	SH 66